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Assessment of soil erosion in tropical ecosystem of Goa, India using Universal Soil Loss Equation, geostatistics and GIS

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ABSTRACT

Soil erosion in tropical ecosystem of Goa, India was assessed using Universal Soil Loss Equation (USLE), geostatistics and Geographic Information System (GIS). In the study, field data collected for 500 locations at 2.5 km grid interval on various pedological and land use parameters were used to compute USLE factors (R, K, LS, C and P) and develop thematic rasters using Gaussian kriging model in GIS for assessment of soil loss in the state. The results showed that about 53.0% of total geographical area (TGA) in the state is subject to severe (20-40 t ha⁻¹yr⁻¹), very severe (40-80 t ha⁻¹yr⁻¹) and extremely severe (>80 t ha⁻¹yr⁻¹) soil erosion. Based on the severity of soil erosion in the state, Bardez, Bicholim, Pernem and Ponda tehsils have been categorized under high priority zone with very severe (40-80 t ha⁻¹yr⁻¹) and extremely severe (>80 t ha⁻¹yr⁻¹) soil loss. The study demonstrates that use of USLE, geostatistics and GIS becomes a powerful approach in spatial assessment of soil erosion and identify the erosion prone areas.